



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/682,957

11/02/2001

Andres Bryant

BUR920010071US1

3893

23123

7590

12/03/2002

SCHMEISER OLSEN & WATTS
18 E UNIVERSITY DRIVE
SUITE # 101
MESA, AZ 85201

EXAMINER

LEWIS, MONICA

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 12/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/682,957

Applicant(s)

BRYANT ET AL.

Examiner

Monica Lewis

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. This office action is in response to the election filed November 5, 2002.

Election/Restrictions

2. Applicant's election of Group I in Paper No. 4 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Priority

3. It is noted that this application appears to claim subject matter disclosed in prior copending Application No. 09/886,823, filed 6/21/01. A reference to the prior application must be inserted as the first sentence of the specification of this application or in an application data sheet (37 CFR 1.76), if applicant intends to rely on the filing date of the prior application under 35 U.S.C. 119(e) or 120. See 37 CFR 1.78(a). Also, the current status of all nonprovisional parent applications referenced should be included.

If the application is a utility or plant application filed on or after November 29, 2000, any claim for priority must be made during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2) and (a)(5). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A priority claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed claim for priority under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by

Art Unit: 2822

(1) a surcharge under 37 CFR 1.17(t), and (2) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Commissioner may require additional information where there is a question whether the delay was unintentional. The petition should be directed to the Office of Petitions, Box DAC, Assistant Commissioner for Patents, Washington, DC 20231.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 14 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear what is meant by the following: a) “within and about” (See Claim 14); and b) “fin structure” (See Claims 14 and 20).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 8-20, as far as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (U.S. Patent No. 5,994,747) in view of Houston (U.S. Patent No. 6,045,625).

In regards to claim 8, Wu et al. (“Wu”) discloses the following:

a) a semiconductor wafer overlying a semiconductor layer (2) (See Figure 9);

Art Unit: 2822

b) a first recess and a second recess formed through the semiconductor layer (See Figure 9);

c) a body (6) formed from the semiconductor layer situated between the first recess and the second recess, the body comprising a top body surface and a bottom body surface that defines a body thickness (See Figure 9);

d) a source structure (14) formed into the first recess, the source structure comprising a source region (See Figure 9);

e) a drain region formed into the second recess, the drain structure comprising a drain region (See Figure 9); and

f) a top portion of the source structure and a top portion of the drain structure are within and abut the body thickness.

In regards to claim 8, Wu fails to disclose the following:

a) a semiconductor layer overlying a buried insulator having at least two layers.

However, Houston discloses a semiconductor with an insulation layer that has various layers (See Figure 5e). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Wu to include an insulation layer that has various layers as disclosed in Houston because it aids in eliminating warping.

In regards to claim 9, Wu discloses the following:

a) a semiconductor layer (See Figure 9).

In regards to claim 9, Wu fails to disclose the following:

a) the first layer of the buried insulator.

However, Houston discloses a semiconductor with an insulation layer (See Figure 5e). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Wu to include an insulation layer as disclosed in Houston because it aids in eliminating warping.

Art Unit: 2822

In regards to claim 10, Wu discloses the following:

- a) a semiconductor layer comprises single crystal silicon (See Column 3 Line 43).

In regards to claim 11, Wu fails to disclose the following:

- a) the buried insulator comprises three layers, wherein a second layer is different from the first layer and a third layer.

However, Houston discloses a semiconductor with an insulation layer that has various layers (See Column 2 Lines 43-50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Wu to include an insulation layer that has various layers as disclosed in Houston because it aids in eliminating warping.

In regards to claim 12, Wu fails to disclose the following:

- a) the first layer comprises silicon dioxide, wherein the second layer comprises silicon nitride, wherein the third layer comprises silicon dioxide.

However, Houston discloses a semiconductor with insulation layers that has silicon dioxide and silicon nitride (See Column 2 Lines 43-50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Wu to include an insulation layer that has silicon dioxide and silicon nitride as disclosed in Houston because it aids in providing low capacitance.

In regards to claim 13, Wu discloses the following:

- a) a first recess and a second recess (See Figure 9).

In regards to claim 13, Wu fails to disclose the following:

- a) a buried insulator.

However, Houston discloses a semiconductor with an insulation layer that has various layers (See Figure 5e). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Wu to include an insulation layer that has various layers as disclosed in Houston because it aids in eliminating warping.

In regards to claim 14, Wu discloses the following:

a) the body comprises a fin structure that comprises a top fin structure surface a bottom fin structure surface that define a fin structure thickness, wherein the top portion of the source structure and the top portion of the drain structure are within and abut the fin structure thickness (See Figure 9).

In regards to claim 15, Wu discloses the following:

a) a silicon layer (See Figure 9).

In regards to claim 15, Wu fails to disclose the following:

a) a silicon layer overlying on a buried insulator that comprises a first buried insulator on a second buried insulator different from the first buried insulator layer, wherein the first buried insulator layer is at least as thick as the silicon.

However, Houston discloses a semiconductor with an insulation layer that has various layers (See Figure 5e and Column 2 Lines 43-50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Wu to include an insulation layer that has various layers as disclosed in Houston because it aids in eliminating warping.

In regards to claim 16, Wu fails to disclose the following:

a) the first buried insulator layer comprises silicon dioxide.

However, Houston discloses a semiconductor with an insulation layer that has silicon dioxide (See Column 2 Lines 43-50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Wu to include

Art Unit: 2822

an insulation layer that has silicon dioxide as disclosed in Houston because it aids in providing low capacitance.

In regards to claim 17, Wu fails to disclose the following:

- a) the second buried insulator layer comprises silicon nitride.

However, Houston discloses a semiconductor with an insulation layer that has silicon nitride (See Column 2 Lines 43-50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Wu to include an insulation layer that has silicon nitride as disclosed in Houston because it aids in providing low capacitance.

In regards to claim 18, Wu discloses the following:

- a) a transistor (See Figure 9).

In regards to claim 19, Wu discloses the following:

- a) the transistor comprises a source structure and a drain structure recessed through the first buried insulator layer (See Figure 9).

In regards to claim 20, Wu discloses the following:

- a) the transistor further comprises a fin structure (See Figure 9).

Conclusion

8. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure: a) Brigham (U.S. Patent No. 6,274,913) a transistor structure with embedded source/drain junction; b) Yu (U.S. Patent No. 6,225,173) discloses a recessed channel structure; c) Brigham et al. (U.S. Publication No. 2001/0036693) discloses a shielded transistor; d) Tseng (U.S. Publication No. 2002/0168823) discloses a recessed lightly doped drain field

Aft Unit: 2822


effect transistor; e) Pfiester (U.S. Patent No. 5,426,315) discloses a thin film transistor; and f) Su et al. (U.S. Patent No. 5,208,472) discloses a mos device.

9 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 703-305-3743.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML

November 29, 2002



AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800